HENRY BOWMAN BRADY.

HENRY BOWMAN BRADY was born on February 23, 1835, at Gateshead. His father, an esteemed medical practitioner of that place, belonged to the Society of Friends, and retained to the end the dress and manner of conversation of that body. The father's house, for many years the home of the son, was one of those charming Quaker abodes where strength and quietude sit side by side, and where homely plenty and orderly preciseness hide for a moment from the stranger the intellectual activity which is filling the place. Though the son, when I knew him, had abandoned the characteristic dress and speech of the Society, without, however, withdrawing from the body, the influences of his surroundings moulded his character, making him singularly straightforward and free from manner of guile.

After an ordinary school career spent in Yorkshire and Lancashire, and an apprenticeship under the late Mr. T. Harvey, of Leeds, and some further study at Newcastle in the laboratory of Dr. T. Richardson, which may be considered as the forerunner of the present Newcastle College of Science, he started at business in that city as a pharmaceutical chemist in 1855, while yet a minor. That business he conducted with such ability that in 1876 he felt able to resign it to Mr. N. H. Martin, and to devote the whole of his time to scientific work.

He contributed to science in two ways—one direct, the other indirect. Of the many scientific movements of the last thirty years or so, one not of the least remarkable has been the scientific development of the pharmaceutical chemist. Into that movement Brady threw himself with great vigour, especially in his earlier years. He was for many years on the Council of the Pharmaceutical Society, and the progress of that body was greatly helped by his wide knowledge of science and of scientific men and things, as well as by his calm and unprejudiced judgment.

His more direct contributions to science were in the form of researches in natural history, more especially on the Foraminifera. His first publication seems to have been a contribution in 1863 to the British Association as a report on the dredging of the Northumberland coast and Dogger Bank; his last was a paper which appeared only a short time ago. Between these two he published a large number of researches, including a monograph on Carboniferous and Permian Foraminifera, an exhaustive report on the Foraminifera of the *Challenger* Expedition, as well as monographs on Parkeria and Loftusia, and on Polymorphina, in which he was joint author.

By these works he not only established a position, both in this country and abroad, as one of the highest authorities on the subject, but, what is of more importance, largely advanced our knowledge. Every one of his papers is characterized by the most conscientious accuracy and justice; and though his attention was largely directed to classification and to the morphological points therein involved, his mind, as several of his papers indicate, was also occupied with the wider problems of morphological and biological interest which the study of these lowly forms suggests. I have myself often profited by his wide knowledge and power of accurate observation in discussing with him questions of this kind arising out of his studies, and learning from him views and opinions which, to his critical mind, were not as yet ripe enough for publication.

The leisure of the last fifteen years gave him opportunity for travel, and he visited various parts of the world, utilizing many of his journeys—notably one to the Pacific Ocean—in the collection and study of Foraminifera. Some of these travels were undertaken on the score of health, to avoid the evils of an English winter, for he was during many years subject to chronic pulmonary mischief.

During his last journey for this purpose—one to the Nile in the winter of 1889-90—he met with difficulties, and failed to receive the benefit from the change which he had secured on former occasions. During the last two or three years, and especially during the last year, his condition gave increasing anxiety to his friends; the malady against which he had so long struggled seemed to be beating him at last; and we heard with sorrow rather than with surprise that the fierceness of the recent cold had conquered him. Settled for the winter at Bournemouth, and full of cheerful hopes for the coming summer, he succumbed to a sudden attack of inflammation of the lungs, and died on January 10, 1891.

Science has lost a steady and fruitful worker, and many men of science have lost a friend and a helpmate whose place they feel no one else can fill. His wide knowledge of many branches of scientific inquiry, and his large acquaintance with scientific men, made the hours spent with him always profitable; his sympathy with art and literature, and that special knowledge of men and things which belongs only to the travelled man, made him welcome also where science was unknown; while the brave patience with which he bore the many troubles of enfeebled health, his unselfish thoughtfulness for interests other than his own, and a sense of humour which, when needed, led him to desert his usual staid demeanour for the merriment of the moment, endeared him to all his friends.

M. FOSTER.

NOTES.

PROF. VICTOR HORSLEY AND MR. FRANCIS GOTCH have been appointed Croonian Lecturers to the Royal Society for the present year. They have chosen as their subject, "The Mammalian Nervous System; its Functions and their Localization as determined by an Electrical Method." Thursday, February 26, is the date fixed for the delivery of the lecture.

A VERY valuable addition has just been made to the Kew Herbarium by the purchase of an extensive collection of dried plants from West Sze-chuen and the Tibetan frontier, at elevations of 9000 to 13,500 feet, lately brought home by Mr. A. E. Pratt, who travelled and collected ornithological and other specimens of natural history at the expense of Mr. J. H. Leech. The botanical specimens are excellent, and promise many novelties of Himalayan affinities.

A CIVIL LIST pension of £150 has been granted to Lady Burton, the widow of the eminent traveller and Oriental scholar. The movement for this recognition of Sir Richard Burton's brilliant achievements originated with the Council of the Royal Geographical Society, who were supported by the Royal Asiatic Society, the British Association, and the Anthropological Institute.

A LETTER from the Palais des Académies, at Brussels, announces the death of Lieut.-General Liagre, the Permanent Secretary of the Académie Royale des Sciences, des Lettres, et des Beaux-Arts de Belgique. He was born at Tournai, in 1815, and died at Ixelles, on the 13th of this month.

WE are glad to see that the *Speaker* has taken up the subject on which we have had so much to say lately—that of the proposed South Kensington and Paddington Subway Railway. In the current number it has an able and most interesting article, directing attention to the fact that the introduction of electricity as a motive power for trains has created a new peril for institutions devoted to the teaching of physical science. It points out that in the neighbourhood of an electric railway, such as that now running in South London, a moderately advanced course in experimental physics could not be given, and that even comparatively rough apparatus would be affected. The course marked out for the proposed line runs under one of the physical laboratories of the Royal College of Science, and is separated by the breadth of the road only from the other; and it passes within a few yards of the City and Guilds Central Institute for Technical Education. "That the line might be in some respects convenient," says the *Speaker*, "is quite possible; that if the powers to employ electricity are granted and used as at Stockwell, existing physical laboratories will be rendered useless, is certain. The South London line is surrounded by an iron tube which acts as a 'magnetic screen,' and serves to diminish its magnetic effects on external objects. No such precaution is, as far as we are aware, to be adopted at Kensington, and in this respect, at all events, the proposed line is likely to be the more injurious of the two. To the laboratories of the Royal College of Science teachers are brought by Government funds from all parts of the country. Every summer two hundred come from far and near to hear lectures and to go through a course of laboratory work. We believe that one of the main objects of the College is to raise the standard of knowledge among those on whom many a small town has to depend for scientific instruction. It is improbable that the laboratories could be removed from South Kensington, for their connection with the great collection of scientific apparatus in the Museums is essential. The City and Guilds Central Institute has been built at a cost of £100,000. After some years of contest with our English lethargy it has reached success. The electrical department is full. Is it reasonable that a commercial company should be allowed to acquire powers to ruin the physical laboratories of two such institutions by the employment of electric traction?"

WITH respect to our report of the meeting of the Royal Society of Edinburgh of January 5 (p. 287), Sir William Thomson writes to us that a statement attributed to him is obviously incorrect, and that six lines and three words after the words "Sir William Thomson, however," near the end of the report, should be deleted. "It is obvious," he says, "that any upward current of air which could carry drops of water 40 or 50 feet up from the sea is more than amply sufficient to supply what a bird needs for soaring."

AT the meeting of the International Congress of Hygiene and Demography there will be a special section for the discussion of questions connected with the relations of the diseases of the lower animals to those of man. The section proposes to consider, amongst other subjects, the infectious, contagious, parasitic, and other diseases communicable from animals to man, and *vice versâ;* the methods of the propagation of diseases affecting mankind by means of animals and animal products; the infection of meat, milk, and other comestibles; and the restrictions to be placed upon the sale of infected food and the movement of infected animals. On each of these questions papers will be obtained from prominent British and Continental authorities as the basis of debates. The President of the section will be Sir Nigel Kingscote, Chairman of the Board of Governors of the Royal Veterinary College. Prof. G. T. Brown and Dr. E. Klein, F.R.S., will act as Vice-Presidents.

THE *Kew Bulletin* for January opens with an interesting section on West African bass fibre, the prospects of which in the English market seem to be remarkably good. Writing on a sample sent to them from the Royal Gardens, Kew, Messrs. Ide and Christie, on October 10, 1890, expressed the opinion that, if properly selected and cleaned, the fibre might sell at £25 per ton in London, a figure which, they thought, would leave a handsome profit to the producer. Writing again, on October 24, Messrs. Ide and Christie stated that a few bales had been sold, and had fetched the extreme price of £42. They added, "We scarcely expect this price would be maintained for substantial quantities, but for fibre of equal merit, the immediate outlook would seem to indicate that £35 or £40 might be the range of value."

THE same number of the *Kew Bulletin* contains a paper on Chinese ginger, of which it is said in China, where it grows, that it never flowers. Dr. H. A. Alford Nicholls, writing from Dominica, West Indies, on July 5, 1890, and Mr. Charles Ford, writing from Hong Kong, on July 10, 1890, both state that the plant has flowered under their care. Mr. W. T. Thiselton Dyer contributes a paper in which he gives a full and most lucid account of the production of seed and seminal variation in the sugar-cane. Referring to the work done by Messrs. Harrison and Bovell in the West Indies in connection with this subject, Mr. Dyer points out that it was undoubtedly anticipated in Java. He does ample justice, however, to the independent labours of these gentlemen. Noting that their discovery has been termed "accidental," he says:—"Even if true, that is no demerit. Most discoveries in some sort are accidental. They often lie, so to speak, under our eyes, and only reveal their significance to those who are ready to appreciate it. This Messrs. Harrison and Bovell did, and the greatest credit is due to them for the fact. All that Kew has done in the matter was to put it on record, and give it a scientific verification. For my own part, I have no doubt, looking at the whole history of the improvement of cultivated plants, that the discovery, for so I think it, of Messrs. Harrison and Bovell, has been the starting-point of a new era in the cultivation of the sugar-cane."

MR. CLEMENT WRAGGE, the Government Astronomer of Queensland, has sailed from Brisbane for the New Hebrides, where he is to superintend the erection of some Observatories on the islands. They will be maintained at the expense of the Queensland Government.

AT the next International Geographical Congress, which will be held at Berne from August 10 to 15, the following will be the principal subjects considered:—(1) Technical geography (mathematical geography, geodesy, topography, cartography, photography, &c.). Under this head will be discussed the first meridian and the spelling of geographical names. (2) Physical geography (hypsometry, hydrography, meteorology, variation of climate, the boundary-line of the ice, terrestrial magnetism, botanical, zoological, and geological geography, volcanoes, earthquakes, ethnography, anthropology, and archæological geography). (3) Commercial geography. (4) Travels and discoveries. (5) The extension of geographical knowledge. Those who propose to contribute papers should write to Dr. Gobat, Berne, not later than March 1.

MR. R. BOWDLER SHARPE has received from America an interesting testimonial, congratulating him on the completion of the thirteenth volume of the British Museum "Catalogue of Birds." It is signed by members of the American Ornithologists' Union, and other American naturalists. They express the warmest appreciation of Mr. Sharpe's labours as an ornithologist, especially of his work in connection with the classification and the nomenclature of the Passeres. Among the signatures we note those of G. N. Lawrence, J. A. Allen, Elliott Coues, R. W. Shufeldt, C. B. Cory, Robert Ridgway, and G. Brown Goode.

DR. HUGH ROBERT MILL is delivering in Edinburgh a course of twelve lectures on "The Earth and Man: a Study in Advanced Geography." The lectures are being given under the auspices of the Scottish Geographical Society, and are intended to illustrate a memorial recently presented by the Society to the Universities Commission, asking that lectureships on geography should be founded in the Scottish Universities. The attendance is most encouraging, 104 tickets having been taken.

SOME time ago M. Berthelot, judging from a text of the eleventh century, formed the opinion that the word "bronze" was derived from "Brundusium," or Brindisi. According to *La Nature*, this view has been confirmed by the discovery of a passage in a document of the time of Charlemagne, where reference is made to the "composition of Brundusium":—copper, two parts; lead, one part; tin, one part. It would appear that at Brundusium bronze was in ancient times manufactured on a great scale.

The Report of the Honorary Committee for the Management of the Calcutta Zoological Gardens says that, in accordance with a suggestion in the resolution of the Government of Bengal on the Committee's Report for the year 1888–89, a hand-book embodying the experiences gained in the management of animals in the Zoological Gardens, Calcutta, is in course of preparation.

A national Exhibition will be held at Palermo from November 1891 to May 1892. It will include an international section for engines and machinery relating to industries such as are carried on in small workshops or dwellings.

The collection of birds made by Mr. F. J. Jackson during his recent successful expedition to Uganda has been placed in the hands of Mr. Bowdler Sharpe, who, in the current number of the *Ibis*, describes fourteen new species, chiefly from Mount Elgon and the Kikuyu country. In the same periodical Mr. Ogilvie Grant describes four new species of Francolin and a new Hornbill. In the April number of the *Ibis* Mr. Sharpe will continue his account of Mr. Jackson's collection, and we understand that the list of novelties is by no means exhausted. The birds of the Teita district and those obtained in Ukambani seem to be the same as those of Shoa; but on Mount Elgon Mr. Jackson appears to have met with a peculiar fauna, which, to judge by the birds alone, has relations with the Cameroons, one or two species being closely allied to forms only known from the high mountains of this part of Western Africa.

At the recent meeting of the American Ornithologists' Union, Mr. D. G. Elliot was elected President. Mr. Elliot is well known for his sumptuous zoological works, of which the monographs of the *Felidæ* and the *Phasianidæ* are the most important, the illustrations having been drawn by Mr. Wolf. Dr. Elliott Coues has retired from the Vice-Presidency, but remains on the Council of the Union. The active members number fifty-two, the honorary members twenty-eight, the corresponding members seventy-one, and the associate members 368. In the roll we notice several ladies' names. In the January number of the *Auk* appears a plate of *Icterus northropi*, drawn by Mr. J. L. Ridgway, and far exceeding in execution anything that the journal in question has hitherto produced. Our own ornithological journal, the *Ibis*, will have to look to its laurels, for recently, though the drawing of Mr. Keulemans has been as splendid as ever, the colouring of the plates has been anything but accurate.

An American Morphological Society has lately been formed. A well-attended meeting was held for its "inauguration" in the Massachusetts Institute of Technology, Boston, on December 29 and 30, 1890. Prof. E. B. Wilson occupied the chair, and Prof. C. O. Whitman was appointed President for the current year. After the details of the organization had been completed, the following papers were read and discussed:—On the development of the Scyphomedusæ, by I. Playfair McMurrich; on the intercalation of vertebræ, by G. Baur; the heliotropism of Hydra, a study in natural selection, by E. B. Wilson; the early stages of the development of the lobster, by H. C. Bumpus; some characteristics of the primitive vertebrate brain, by H. F. Osborn; the development of Nereis and the mesoblast question, by E. B. Wilson; the præ-oral organ of Xiphidium, by W. M. Wheeler; a review of the Cretaceous Mammalia, by H. F. Osborn; spermatophores as a means of indirect impregnation, by C. O. Whitman; the phylogeny of the Actinozoa, by I. Playfair McMurrich.

The National Association for the Promotion of Technical and Secondary Education has issued a report of the proceedings of the Conference between the executive committee and representatives of County Councils and others, held at the Society of Arts on December 5, for the discussion of the working of the education clauses of the Local Taxation Act, 1890. The Association also publishes selected reports of committees of County Councils, and other schemes and proposals for the utilization of the new fund for educational purposes. These reports have been edited by the secretaries of the Association.

The *Annuaire de l'Académie Royale de Belgique* for 1891 has recently been issued. It mainly contains an historical account of the organization and work of the various sections of the Academy, and notices of deceased members.

The *Annals of the Astronomical Observatory of Harvard College*, vol. xxx., Part 1, contains the observations made at the Blue Hill Meteorological Observatory, Massachusetts, U.S.A., in the year 1889, and a statement of the local weather predictions, by Mr. A. Lawrence Rotch. Special attention has been paid to observations of the distribution, density, and amount of cloud throughout the year. The thermometric and barometric readings, wind movements, and rainfall have been tabulated and summarized in a very concise manner.

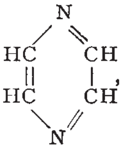
A pamphlet has been received from Mr. John Romanes, in which several questions of cosmical physics are discussed. The author believes that the planets, and probably their satellites, are ejects from the sun. He attempts to explain the motions and the forms of the orbits of these bodies on this theory, extends the results to double and multiple stellar systems, and propounds a new hypothesis as to the origin of celestial species.

Signor Guglielmo has sent us a paper, presented to the Accademia dei Lincei in September 1890, in which he describes a method for multiplying the dispersive power of a spectroscope, by means of mirrors so arranged that they cause the rays of light to traverse the prisms several times.

On February 7 and the three following Saturday afternoons, at 4.15 p.m., Prof. H. G. Seeley, F.R.S., will deliver a course of four lectures, at the Gresham College, Basinghall Street, on "The Gravel-beds of the Thames and its Tributaries in relation to Ancient and Modern Civilization." The lectures will be given in connection with the London Geological Field Class.

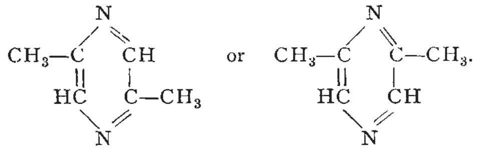
The third series of lectures provided by the Sunday Lecture Society begins on Sunday afternoon, February 1, in St. George's Hall, Langham Place, at 4 p.m., when Mrs. S. D. Proctor will lecture on "The Life and Death of Worlds," with illustrations by the oxyhydrogen lantern. Lectures will subsequently be given by Prof. Marshall Ward, Mr. Charles Cassal, Mr. J. M. Robertson, Mr. Arthur Nicols, Miss A. B. Edwards, and Prof. Percy Frankland.

A new class of organic bases, resembling the pyridine series in constitution but containing two atoms of nitrogen, have been synthetically prepared by Dr. Stoehr, of the University of Kiel, and are described in the latest issue of the *Journal für praktische Chemie*. They were obtained as secondary products in the reactions between glycerine and ammonium salts. Their general formula is $C_nH_{2n-4}N_2$, and they appear to be the higher homologues of the diamine $C_4H_4N_2$,



which bears the same relation to pyridine as the latter bears to benzene. They are rendered doubly interesting by the fact that

Dr. Stoehr has also discovered their presence in the products of distillation of the alkaloid brucine. The best investigated member of the series, $C_6H_8N_2$, is a clear colourless liquid just slightly heavier than water, its sp. gr. at 0° being 1·0079. It boils constantly without decomposition at 153°·5–154° C. (corr.), and determinations of its vapour density at the temperature of naphthalene vapour by Victor Meyer's method yield numbers pointing to the above molecular composition. From its reactions it appears to be the dimethyl derivative of the primary diamine, and may consequently possess the constitution



It exhibits almost all the properties of the pyridine bases. Its odour is very similar to that of the higher members of that series, but reminds one, at the same time, of the narcotic bases, particularly nicotine. It is soluble in water, dissolving with such considerable rise of temperature as to indicate the formation of a hydrate; it is precipitated from its aqueous solution on the addition of potash. It is, curiously, nearly as soluble in cold water as in hot—a phenomenon which is familiar to us in the case of common salt. Its salts are most remarkably like those of the pyridines, and the peculiarities exhibited by the latter are strongly accentuated in them. Thus the hydrochloride, $C_6H_8N_2.HCl$, is deliquescent and sublimes below 100°. The platinochloride, $C_6H_8N_2.2HCl.PtCl_4 + 3H_2O$, which forms fine crystals of the colour of bichromate of potash, possesses in a marked manner the property so characteristic of the platinochlorides of the pyridines, known as "Anderson's reaction," of parting with hydrochloric acid on warming in solution, and depositing condensed salts. On merely warming the solution, bright yellow crystals of the salt $(C_6H_8N_2)_2PtCl_4$ commence to deposit. The double salt with gold chloride, $C_6H_8N_2.HCl.AuCl_3$, forms magnificent acicular crystals several inches long, while the mercuric chloride salt forms large rhombohedrons. The second member of the series investigated proved to have the molecular composition $C_8H_{12}N_2$, and to be an ethyl derivative of the primary diamine. It was likewise a liquid, boiled at 178°·5 (corr.), and possessed properties analogous to the methyl compound just described.

THE additions to the Zoological Society's Gardens during the past week include a Macaque Monkey (*Macacus cynomolgus* ♂) from India, presented by Count Povoleri, F.Z.S.; a Ring-tailed Coati (*Nasua rufa* ♂) from Guatemala, presented by Mr. Cyril Smith; two Hawfinches (*Coccothraustes vulgaris*), British, presented by Mr. J. Newton Hayley; two Blood-breasted Pigeons (*Phlœgnas cruentata*) from the Philippine Islands, a Chinese Turtle Dove (*Turtur chinensis*) from India, presented by Mr. Wilfred G. Marshall; a Rhesus Monkey (*Macacus rhesus* ♀) from India, a Yellow-crowned Penguin (*Eudyptes antipodum*) from New Zealand, deposited.

OUR ASTRONOMICAL COLUMN.

DARK TRANSITS OF JUPITER'S SATELLITES.—The Publications of the Astronomical Society of the Pacific, vol. ii. No. 11, contains several communications on dark transits of the satellites of Jupiter. Mr. Keeler sums up the phenomena as follows:—

(1) In ordinary transits, the satellite is bright when projected upon the surface of Jupiter near the limb, and is usually lost sight of when it reaches the central parts of the disk.

(2) Occasionally the satellite appears darker than the surface of Jupiter when in transit, even when projected on the brightest parts of the disk, and the depth of shade may be very considerable, as a satellite has often been mistaken for its shadow. On leaving the disk, the satellite nevertheless appears quite bright when projected against the sky.

(3) Dark transits of satellites increase in frequency with the order of distance from the primary, being more common for the outer satellites than for the inner ones.

(4) The phenomena are irregular in occurrence, and therefore not predictable.

In order to account for these facts a variety of theories have been propounded. Mr. Keeler advances the idea that the satellites are surrounded by atmospheres containing large quantities of aqueous vapour. A circulation of clouds may thus be set up by means of the intrinsic heat of the central planet. The cloud surfaces of the primary and its satellites being similar, the albedo of the two may be equal. If, however, any accidental disturbance should be set up which would cause a precipitation on the side of the satellite furthest from the source of heat, the albedo would be diminished, and if, at such a time, the satellite was passing across the disk of Jupiter, we should have the phenomena of a dark transit. On this supposition the unstable condition of the atmospheres of the outer satellites sufficiently explains their frequent dark transits.

A simpler and therefore more probable explanation is supported by Prof. Holden. It is that the phenomena of both bright and dark transits depend upon the contrast between the brightness of a satellite and that of the part of the planet upon which it happens to be projected. He finds that much of Jupiter's surface is only about three or four times as bright as the limbs—that is, has an albedo three or four times 0·07. If this be so, then on a background of 0·21 or 0·28, the first satellite, having an albedo of 0·22, or the second, with an albedo of 0·27, would usually be lost. Careful observations of the phenomena attending these transits will considerably elucidate the matter.

SOLAR ACTIVITY (JULY–DECEMBER 1890).—In *Comptes rendus* for January 19, Prof. Tacchini gives the following *résumé* of the solar observations made at the Royal Observatory of the Roman College during the second half of 1890:—

	Relative frequency		Relative magnitude		Number of groups per day.
1890.	of spots.	of days without spots.	of spots.	of faculæ.	
July	3·80	0·40	8″·23	12″·83	0·97
August	3·42	0·52	15·29	11·77	0·68
September	5·83	0·18	23·68	22·32	1·46
October	3·17	0·58	17·33	10·83	0·75
November	2·45	0·50	7·95	22·75	0·55
December	3·38	0·38	9·25	17·75	0·81

The observations extend over 149 days. The following are the results obtained for solar prominences:—

		Prominences		
1890.	Number of days of observation.	Mean number.	Mean height.	Mean extension.
July	30	2·07	33″·8	1°·4
August	31	2·65	27·5	1·1
September	24	2·88	35·8	1·2
October	22	8·05	40·6	1·5
November	16	2·13	28·0	1·5
December	12	3·42	40·4	1·6

M. Marchand, in the same number, gives the result of sun-spot observations made at Lyons Observatory last year. The following are the mean total areas of the groups measured expressed in millionths of the sun's visible hemisphere:—

January	22·5	July	49·7
February	20·0	August	51·0
March	51·0	September	154·1
April	34·6	October	160·5
May	20·5	November	137·2
June	8·3	December	41·0

M. Marchand remarks that in 1890 the proportion of days without spots was 0·456, whilst it was 0·555 in 1889. On the other hand, in 1889, only 29 groups of spots were observed, having a total surface area of 1890 millionths of the sun's visible hemisphere. In 1890, 43 groups had a total surface area of 3760 millionths. It is evident, therefore, that there was a sensible augmentation of solar activity last year.